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Benjamin

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(54) **ACTIVE ACOUSTIC ARRAY FOR ULTRASONIC BIOMEDICAL APPLICATIONS**

(75) Inventor: **Kim C. Benjamin**, Portsmouth, RI (US)

(73) Assignee: **The United States of America as represented by the Secretary of the Navy**, Washington, DC (US)

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(58) **Field of Search** 600/430, 443, 600/447, 449, 445, 463, 461; 178/916

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Primary Examiner—Francis J. Jaworski
Assistant Examiner—Maulin Patel
(74) *Attorney, Agent, or Firm*—Michael J. McGowan; James M. Kasischke; Michael F. Oglo

(57) **ABSTRACT**

The present invention relates to a device for detecting cancer in human tissue. The device comprises an acoustic array shaped to conform to and surround a portion of the human anatomy and a material for acoustically coupling the acoustic array and the human anatomy portion. The acoustic array is formed from a plurality of doubly curved segments. Each segment is formed by a piezoelectric ceramic polymer composite material with an acoustic element pattern formed on one surface via the selective deposition of a conductive material. The acoustic element pattern contains a plurality of acoustic elements which act as both transmitters and receivers. The acoustic array further includes a backing material which provides a desired mechanical damping to each segment and defines the shape of the array. The device further includes a housing which includes signal conditioning electronics to condition signals received from the acoustic array. A central processing unit is provided to create cross sectional images of the human tissue under examination. A display unit is provided to display the cross sectional images.

19 Claims, 4 Drawing Sheets